REMARKS/ARGUMENTS

In response to the Non-Final Rejection mailed May 4, 2005, Applicants have amended the specification, claims 51, 52, 55 and 59 and presented the following remarks.

Applicants acknowledge claim 68 as being withdrawn. It should be noted that this claim is a product by process claim. All of the claim's meets and bounds extend from the process that the examiner is presently examining. Therefore, it would not be unduly burdensome to consider claim 68 with the elected claims. Reconsideration is respectfully requested.

The specification has been amended to obviate the objection to the specification.

Claim 51 has been objected to because it is allegedly unclear. The rejection lists a number of questions such as (page 3, line 10) "As written, it is unclear what comprises the first nucleic acid." Strictly speaking Claim 51 does not recite a "first nucleic acid". The claim recites a starting material called "a nucleic acid encoding the first domain of the polypeptide" (not referred to as a "first") and a resulting product called "a first nucleic acid construct" (a construct).

The rejection also states, (page 3, line 12) "Is the first nucleic acid the domain of the polypeptide joined to the first part of the linker as stated in (a)..." A "nucleic acid" is not a "polypeptide" and therefore a yes/no answer cannot be given. Likewise for the question on page 3, line 15-16 "...or is the second nucleic acid the combination of the first and second domains and the linkers". Furthermore, there is no "the second nucleic acid" per se, only a "second domain of the polypeptide" (a polypeptide) or an "a second nucleic acid construct" (a construct).

On page 3, lines 13-14 the examiner questions, "In (c) it is unclear what the second nucleic acid structure is composed of." The answer lies in earlier step (b) where the composition is a nucleic acid resulting from the reaction in step (b), which states on the last line "to produce a second nucleic acid construct".

Claim 51 is clear, particularly in view of the amendments made, and a careful reading of the language will reveal this.

As for the rejection of claim 59, the claim has been amended accordingly.

Claims 52 and 55 were rejected under 35 USC 112, second paragraph as being indefinite by lacking antecedent basis for certain terms. These claims have been amended making this rejection moot.

Claims 51-64 were rejected under 35 USC 103(a) as being unpatentable over Hakim et al in view of Fiedler et al. Hakim et al is cited to show cloning and expressing a single chain antibody of the surface Ig from B cell lymphomas and that this antigen is capable of inducing polyclonal antibodies. Fiedler et al is cited to show expressing a scFv gene in plant cells and suggesting certain advantages of using plant cell hosts. From this, the examiner concludes that it would be obvious to use the plant cell as the host for producing the scFv encoded for by the Hakim et al method. This rejection is respectfully traversed.

The thrust of the invention and claims is to prepare a tumor-specific antigen as a therapeutic vaccine. For a protein to be an effective vaccine, it must induce an appropriate immune response. Hakim et al have tried to do this but in order to succeed, they used a different method and more importantly made a different antigen. The Hakim et al antigens with any type of positive results were all either fused to other large proteins or the result of naked DNA immunization. Table II under Protein Vaccination lists the antibody titers against the antigen in animals after immunization with the antigen. For the scFv antigen, the Total IgG titer was 0. This lack of immune response to scFv protein immunization is suggested again in Figure 5 where the negative control and the scFv immunized animals died at essentially the same rate.

The net teaching of Hakim et al is that one must use either naked DNA immunization or fusion protein immunizations for any meaningful results. Thus, Hakim et al teach away from the present invention, which not only uses a different method but also uses a scFv, which is discouraged.

Fiedler et al may produce a scFv in plants, but there is no indication that this protein can induce a protective immune response either. These scFv may have binding properties to various chemicals, what the examiner appears to refer to as biological activity, but this is a different type of property from that claimed. Fiedler et al does not suggest that they or any other plant-produced scFv will induce an immune response against a disease state. Fiedler et al mentions on page 214, second column, half way down that many antibody fragments are produced from presumably incorrectly folded. Also, Fiedler et al transforms Agrobacterium by electroporation, which in turn is used to transform plant cells. By contrast, the present invention transfects a plant with the vector so that the plant (rather than its offspring) is capable of producing the polypeptide.

Single chain antibodies have an unusual linkage between the domains as well as an idiotype. Even if a person could generate an immune response, it is just as likely to be against the linker and unnatural junction between the domains as the idiotype. Such an immune response would be totally ineffective for the claimed purpose. Therefore, both references are deficient in the important feature of actually producing an effective plant produced anti-idiotype polypeptide self-antigen useful as a tumor-specific vaccine.

Furthermore, attempting to combine the references requires one to speculate that making a scFv of Hakim et al by the method of Fiedler et al would operate. While this is a reasonable guess at what might happen, one lacks the predictability needed to call this particular fact situation "obvious". Plants can glycosylate proteins differently, fold them differently, degrade the new protein and other factors are present which prevent one from predicting that such a recombinant protein would induce an effective immune response.

As a separate issue, claim 55 recites that the vaccine is usable "without a need for adjuvant or other immunostimulatory materials". The active compositions in Hakim et al all had other features and therefore do not suggest that an effective antigen could be made "without a need for adjuvant or other immunostimulatory materials".

As for claim 58, neither of the references suggests the use of a transient plant expression vector. The plant system in Fiedler et al is the production of transgenic plants with primary production in the seeds. By contrast, the present invention uses a

recombinant virus to infect plant cells without necessarily affecting the seeds or remains in the plant genome to produce a transgenic plant.

As for claims 65-67, the linkers used are from a randomized library, not a fixed single linker as used by the references. Hakim et al uses the standard (Gly4Ser)3 linker. Fiedler et al also use a known linker. There is no recognition that one can generate many constructs each with a different linker and select for the resulting scFv with best properties, regardless of what properties one wishes.

In view of the above amendments and comments, the claims are now in conditions for allowance and applicants request a timely Notice of Allowance be issued in this application.

If needed, applicants petition for sufficient extension of time for consideration of this paper.

The commissioner hereby is authorized to charge payment of any fees, including extension of time fees, under 37 CFR § 1.17, which may become due in connection with the instant application or credit any overpayment to Deposit Account No.500933.

Respectfully submitted,

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